NEO/SCI STUDENT'S GUIDE

NAME .....

TEACHER/SECTION .....

DATE .....

New ideas for teaching science

ACTIVITY 2

Identifying Owl Prey

What you need

(Per group)

- Diagrams, *Rodent and Bird Skeletons*
- Forceps
- Gloves
- *Key to Owl Prey*
- Marking pen
- Newspaper
- Paper plate
- "Prey Plate" (from Activity 1)
- Ruler, metric
- *Visual Guide to Owl Prey*
- White glue

What to do...

In Activity 2 you will use a two-answer (dichotomous) to identify prey animals removed from the pellet. As your teacher directs, assemble half-skeletons of recovered prey. Additionally, you will determine the "cumulative biomass" of prey that your class "population of owls" consumed.

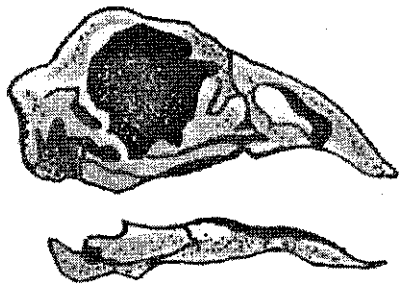
Identifying Prey:

Step 1

Safety: *Put on protective gloves.*

Use the *Key to Owl Prey* to identify recovered prey animals in your group's pellet.

For example: Use the key to identify this prey animal:



1. Go to the key and compare the first set of statements—"1a" and "1b":

   1a "Prey is bony material (skull)" 2

   1b "Prey is not bony material" ..... INSECT

2. Determine which statement best fits the prey animal you are trying to identify.

   Since it is a skull made of bone proceed to statement "2" of the key.

3. Compare the second set of statements in the key:

   2a " Skull has teeth" ..... MAMMAL 3

   2b "Skull has no teeth" ..... BIRD

4. This skull has no teeth and agrees with the key which terminates in a named prey animal—"bird".

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Step 2

Record your group's prey totals in the "Number of Prey Animals (Group)" column of Data Table #1 . Also report your group's prey data to your teacher who will tally prey data for the class and post it on the black board.

Constructing Half-Skeletons:

Step 3

As your teacher directs, select bones from the "Prey Plate" (from Activity 1) to reconstruct a "half-skeleton" of a rodent or bird prey animal on a clean paper plate. Use white glue to affix the bones to the paper plate. Leave spaces for missing bones. Use the "Rodent" or "Bird" skeleton diagrams as a guide during your reconstruction.

Biomass Calculations:

Step 4

Record class data for each prey animal in the "Total Number of Prey Animals (Class)" column of Data Table #1.

Step 5

Finish your calculations in Data Table #1 for the total number of prey animals identified by the class.

To calculate total biomass by prey animal, multiply the number of prey organisms in the "Total Number (Class)" column by its corresponding biomass value in the "Prey Biomass" column.

For example:

If:

8 mice were counted for the class and

the biomass value for each mouse is 24 grams

Then:

8 prey animals (mice) x 24 g biomass /mouse

= 192 g total biomass

To calculate the cumulative total biomass, sum all data in the "Total Biomass (Class)" column. This would include the total biomass for each type of prey for all of the owls in the population surveyed by the class.

To calculate the "Percent Class Owl Population" data in Data Table #1 divide the "Total Biomass (Class) "column for each prey species by the "Cumulative Total Biomass" and multiply your answer by 100 to arrive at the percentage value.

For example:

If:

8 mice were counted by the class with a total biomass of 192g and

the total cumulative biomass for the class is 2000 g

Then:

$$\frac{192\ g}{2{,}000\ g} = 0.096 \times 100 = 9.6\%$$

From the data, one can conclude that mice contribute approximately 10% , on average, of the biomass of the diet of the "population" of owls examined by the class.

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Data Table 1

Analysis of Owl Prey

Prey						
		Biomass Per Prey Animal (grams)	Total Number of Prey Animals (group)	Total Number of Prey Animals (class)	Total Biomass (class)	Percent Class "Owl Population"
Insects		1				
Birds		13				
Mammals						
	Shrew	4				
	Mouse	24				
	Vole	35				
	Rat	130				
				Cumulative Total Biomass:		

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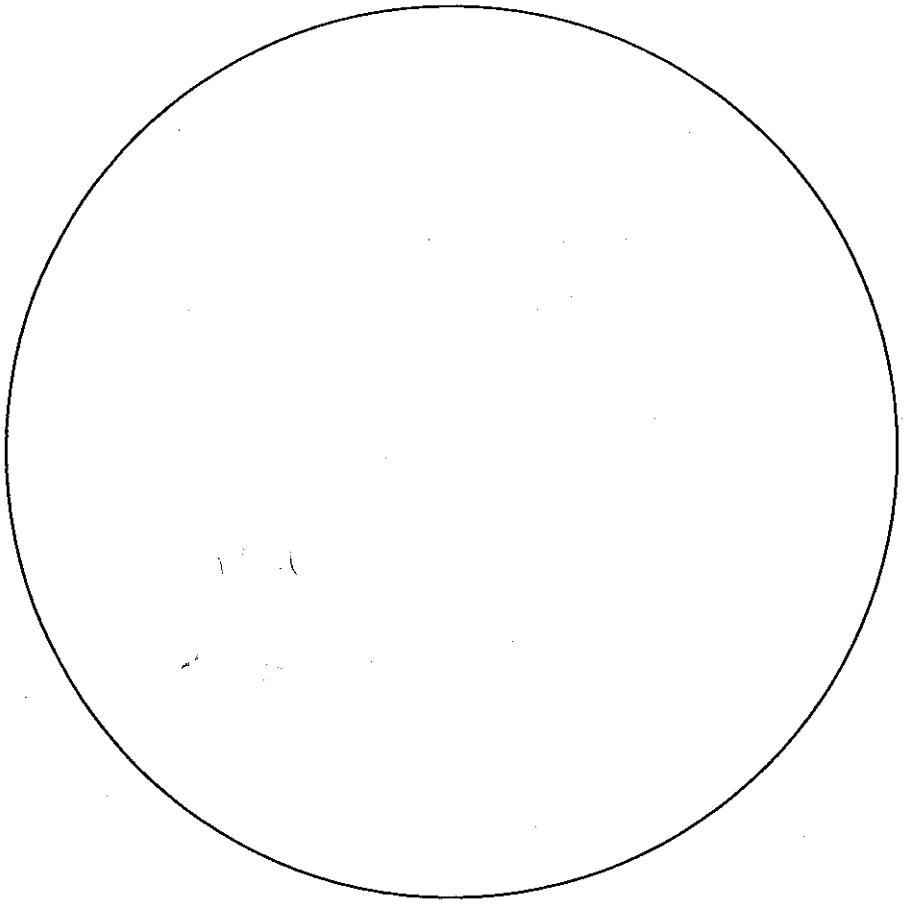
Analyzing Data:

Step 6

Use the calculated "Percent Barn Owl Population" data to create a pie chart—a graph which is useful in showing parts or proportions of a whole. Draw lines that approximate the calculated percentages for each prey organism.



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Questions

1. Based upon the class data, rank the most frequently consumed prey for the class "owl population".

2. If an owl requires approximately 130 g of food per day, how many mice would it need to capture? How many rats?

3. A predator expends energy when hunting for food. Which is the more "energy expensive" cuisine, 35 insects at 1 g each or one 35 g vole?

4. Try to define the food-getting "strategy" of a predator.

5. Based upon your data, suppose the shrew population seriously declined. Would it affect the areas owl population?

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